

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): An electrochemical cell comprising:

a membrane electrode assembly;

a first reactant flow field plate for providing a first reactant flow field disposed on one side of the membrane electrode assembly;

a first seal disposed between the first reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids of the electrochemical cell;

a first gas diffusion layer disposed between the first reactant flow field plate and the membrane electrode assembly for diffusing reactant from the first reactant flow field to the membrane electrode assembly, the first gas diffusion layer including: and comprising

a first side facing the first reactant flow field plate and a second side facing the membrane electrode assembly;

a porous body for diffusing the reactant from the reactant flow field to the membrane electrode assembly; and

an edge portion surrounding the porous body, the edge portion abutting the first seal and the membrane electrode assembly;

~~a second reactant flow field plate for providing a second reactant flow field disposed on the other side of the membrane electrode assembly; and;~~

~~a peripheral support structure for supporting the membrane electrode assembly at a periphery between the first reactant flow field and the first seal to impede substantial distortion of the membrane electrode assembly between the first reactant flow field and the first seal;~~

~~wherein the peripheral support structure comprises an edge portion of the first gas diffusion layer surrounding the porous body; and~~

wherein on the first side of the first gas diffusion layer a thickness of the edge portion is reduced in relation to ~~from one side of~~ the porous body to provide a step between the porous body and the edge portion, the step for engaging the first seal; and

wherein the first seal has a thickness corresponding with a height of the step, such that the second side of the first gas diffusion layer provides a substantially flat surface for supporting the membrane electrode assembly to impede substantial distortion of the membrane electrode assembly at the first seal.

Claim 2 (canceled).

Claim 3 (canceled).

Claim 4 (canceled).

Claim 5 (currently amended): The An electrochemical cell of ~~as claimed in claim 1,~~ 3 wherein the first gas diffusion layer comprises a first side facing the reactant flow field plate and a second side facing the membrane electrode assembly; the step is provided ~~on the second side of the first gas diffusion layer; and, the peripheral support structure further comprising~~ comprises a sealing insert provided on the edge portion to impede leakage of the process fluids.

Claim 6 (canceled).

Claim 7 (currently amended): ~~The~~ An electrochemical cell ~~of~~ as ~~claimed in~~ claim ~~5~~, 6 wherein the seal is a sealing gasket and the sealing insert comprises a slot for accommodating the sealing gasket.

Claim 8 (currently amended): ~~The~~ An electrochemical cell ~~of~~ as ~~claimed in~~ claim 7, wherein the sealing insert has a thickness substantially equal to a thickness of the porous body and has an insert step for engaging the step on the gas diffusion layer.

Claim 9 (currently amended): ~~The~~ An electrochemical cell ~~of~~ as ~~claimed in~~ claim ~~8~~, 5 wherein the sealing insert is substantially impermeable to the process fluids.

Claim 10 (currently amended): ~~The~~ An electrochemical cell ~~of~~ as ~~claimed in~~ claim 9, wherein the sealing insert comprises a silk screened gasket.

Claim 11 (currently amended): A method of impeding leakage of process fluids from an electrochemical cell, the electrochemical cell including having a membrane electrode assembly, a first reactant flow field plate for providing a first reactant flow field disposed on one side of the membrane electrode assembly, a seal disposed between the first reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids of the electrochemical cell, and a second reactant flow field plate for providing a second reactant flow field disposed on the other side of the membrane electrode assembly; the method comprising:

providing a gas diffusion layer disposed between the first reactant flow field plate and the membrane electrode assembly; and;

providing the gas diffusion layer with an edge portion for supporting the membrane electrode assembly at a periphery between the first reactant flow field plate and the seal to impede substantial distortion of the membrane electrode assembly between the first reactant flow field plate and the seal; ;

wherein the edge portion surrounds a porous body, the porous being permeable to the process fluids, and the edge portion is thinner than the porous body, the porous

body comprises a first side and a second side, the thickness of the edge portion is reduced on the second side to provide a step on the second side, and the gas diffusion layer is installed such that the first side faces the membrane electrode assembly and the step on the second side faces and engages the seal, and

wherein the seal has an insert thickness substantially equal to a height of the step and the method further comprises installing the seal and the gas diffusion layer such that the second side of the gas diffusion layer provides a substantially flat surface for supporting the membrane electrode assembly.

Claim 12 (original): The method as defined in claim 11, wherein the edge portion is substantially impermeable to process fluids.

Claim 13 (original): The method as defined in claim 11, wherein the edge portion comprises a liquid silicone gasket for impeding leakage of the process fluids.

Claim 14 (original): The method as defined in claim 11, wherein the edge portion comprises a silk screened gasket for impeding leakage of the process fluids.

Claim 15 (canceled).

Claim 16 (canceled).

Claim 17 (canceled).

Claim 18 (canceled).

Claim 19 (canceled).

Claim 20 (canceled).

Claim 21 (canceled).

Claim 22 (canceled).

Claim 23 (canceled).

Claim 24 (canceled).

Claim 25 (canceled).

Claim 26 (canceled).

Claim 27 (canceled).

Claim 28 (canceled).

Claim 29 (canceled).

Claim 30 (canceled).

Claim 31 (new): An electrochemical cell comprising:

a membrane electrode assembly disposed between a first reactant flow field plate and a second reactant flow field plate;

a first gas diffusion layer disposed between the membrane electrode assembly and the first reactant flow field plate for diffusing reactant from the first reactant flow field to the membrane electrode assembly, the first gas diffusion layer including a body portion and an edge portion, the edge portion having reduced thickness providing a step between the body portion and the edge portion, the step provided on a first side of the first gas diffusion layer facing the first reactant flow field plate; and

a first seal disposed between the first reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids, the first seal abutting the edge portion of the first gas diffusion layer and having a height that corresponds to a height of the step of the first gas diffusion layer such that a second side of the first gas diffusion layer facing the membrane electrode assembly provides a substantially flat first surface for supporting the membrane electrode assembly.

Claim 32 (new): The electrochemical cell of claim 31, further comprising:

a second gas diffusion layer disposed between the membrane electrode assembly and the second reactant flow field plate for diffusing reactant from the second reactant flow field to the membrane electrode assembly, the second gas diffusion layer including a body portion and an edge portion, the edge portion having reduced thickness providing a step between the body portion and the edge portion, the step provided on a first side of the second gas diffusion layer facing the second reactant flow field plate; and

a second seal disposed between the second reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids, the second seal engaging the edge portion of the second gas diffusion layer and having a height that corresponds to a height of the step of the second gas diffusion layer such that a second side of the first gas diffusion layer facing the membrane electrode assembly provides a substantially flat second surface for supporting the membrane electrode assembly.

Claim 33 (new): The electrochemical cell of claim 32, wherein the body portion is electrically conductive and the edge portion is substantially impermeable to the process fluids.

Claim 34 (new): The electrochemical cell of claim 33, wherein the first gas diffusion layer is a single unitary body.